

# BOMBYLIIDAE, AND A FIRST RECORD OF NEMESTRINIDAE FROM SOKOTRA (DIPTERA)

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## SYNOPSIS

The Bombyliidae of Sokotra are reviewed and new species described as the result of the examination of a new collection of specimens from the island made by K. M. Guichard in 1967. The first record of a Nemestrinid, *Atriadops cinnamonea* Brunetti, is also reported.

THE first collections of Diptera from Sokotra were made by W. R. O. Grant, published by Ricardo (1903), and by O. Simony, published by Becker (1910), both in the same year, 1899. No subsequent collections of Diptera were made until 1967 when a collecting expedition to Southern Arabia and Sokotra was made by K. M. Guichard. New material of all the described species from the island has thus become available as well as material of other species both new and not previously known from the island. This new material was collected between March and May, whereas previous visitors who collected Bombyliidae were there in December to February. This difference in timing has not, as far as can be inferred from the Bombyliidae, made a marked difference in the species in flight.

All three collectors travelled in the relatively flat northern part of the island. No specimens of Bombyliidae are available from the higher parts of the Haggier mountains or the southern coastal area. Popov (1957) has provided a description of the vegetation, which can be classified as subdesert and, like the fauna, includes a high proportion of endemics.

The Bombyliidae now known from the island comprise 16 or 17 species, of which 9 are not known from outside Sokotra and Abd-el-Kuri. The remainder are all recorded from the arid adjoining areas of the African mainland and four from Southern Arabia. Of the endemic species only one, *Bombylius socotrae*, is not clearly allied to species known from neighbouring parts of Africa and Arabia. As, however, very little is known of the Bombyliidae of the Somali Peninsula any detailed comparison is premature. Examination of the material leaves a general impression of a tendency to greater size and more striking colouring than mainland counterparts, thus *Petrorossia sokotrae* is on average much larger than any African species and the specimens of *Hemipenthes inauratus* and *Anthrax fuscipennis* are all at the upper limit of size found on the mainland. *Villa dioscoridae* and *Exoprosopa punctipennis* both show the latter tendency to a striking extent.

The record of a Nemestrinid from the island is of interest both because it adds a new family to the faunal list and because it is apparently the same as a species described from Malawi. However, the extent of the distributions of Nemestrinidae cannot be assessed as they are seldom captured.

Family **BOMBYLIIDAE***Bombylius mollis* Bezzi

*Bombylius mollis* Bezzi, 1921 : 15.

The specimen listed as *Bombylius* sp. by Ricardo (1903) has been examined ; although the proboscis is missing and the dorsal surface largely denuded, there is no doubt as to its identity. *B. mollis* is a widespread species ranging from Ethiopia to Transvaal.

SOKOTRA : Adho Dimellus, 3500 ft, 1 ♂, 9.ii.1899 (*W. R. O. Grant*), BM(NH).

*Bombylius socotrae* sp. n.

A single female *Bombylius*, the only other specimen of the genus from Sokotra, represents a remarkable new species with a combination of characters not fitting into any of the groupings erected by Bezzi (1924). It is nearest to the *B. minor* group in its pale whitish pubescence, pale legs with black spines, hyaline wings and black body. These characters, as well as the brown antennae, black proboscis and complete absence of black hairs or bristles except on the legs distinguish it from other species.

*Head* : black with heavy grey tomentum except for the buccal margin which is yellowish grey. Eyes separated by almost three times the width of the ocellar tubercle at the vertex, which is tumid and separated by a groove from the frons. All hair and scales white, shaggy on frons and face, shorter elsewhere and with a broad band of scales surrounding the eyes. Antennae with third segments missing, first and second reddish brown to greyish, first three times the length of second, hairs on first white, second bare except for minute yellowish spicules. Proboscis black, with a reddish base twice the length of the head, palpi reddish brown with colourless spicules. *Thorax* : black, heavily dusted with grey-brown tomentum on the dorsal surface and grey elsewhere, densely covered in greyish white hair, macrochaetae glistening white. *Legs* : coxae black, remainder brown, lighter on the femora and tibiae, darker on the tarsi which are blackish at their tips. Hair on femora and scales white, spines and spicules well developed, black. Fore and mid femora unarmed, hind with a row of six anteroventral spines as well as apical spines above and a single anterodorsal and a single posterodorsal one near the apex. Claws mostly missing, posterior ones black with a reddish base, pulvilli white, almost as long as the claws. *Wings* : hyaline but tinged opaque yellowish at the base in costal cell and in first basal cell. Veins reddish brown at fore border, paler towards the posterior margin where they are yellowish brown. Venation ; middle crossvein almost at middle of discoidal cell, first posterior cell blunt at apex and stalk long, longer than penultimate section of vein. Squamae and alulae white with white fringes. Halteres brownish tinged. *Abdomen* : black with a brownish grey tomentum, tergites reddish at their sides and yellowish on the posterior margins, more broadly at the apex than base. Hairs and bristles white, the latter inconspicuous, weak, hairlike. Ovipositor concealed in a dense tuft of yellow hair.

Length of body 9 mm ; of wing 8 mm ; of proboscis 4 mm.

Holotype ♀. SOKOTRA : Kalinsiya, sea-level, 26.iii.1967 (*K. M. Guichard*), BM(NH).

*Systoechus somali* Oldroyd

*Systoechus somali* Oldroyd, 1947 : 105.

This species, which is well known as a predator of the desert locust, *Schistocerca gregaria* Forskål, is common in Somalia, the Ogaden in Ethiopia and northern Kenya (Hynes, 1947 ; Greathead, 1958). Only a single specimen was collected in Sokotra, but it shows no differences from mainland specimens.

The species belongs to the group with hyaline wings, entirely pale bristles on the legs and no abdominal bristles in the male. The male is distinguished from other species by the entirely blackish hair on the frons and face, dark brown pleural hair, and pale, almost white, silky abdominal hair. The female has white facial hair, three grey vittae on the thorax and the abdomen with pale hairs and dense rows of dark bristles across the tergites.

SOKOTRA : Hammadero, 1100 ft, 1 ♂, 18.iv.1967 (*K. M. Guichard*), BM(NH).

*Geron* sp. ♀

Hesse (1938) has shown that the species of *Geron* are remarkably similar in external characters and can only be distinguished with difficulty except by the characters of the male genitalia. He has also shown that, at least in southern Africa, there are many more species than was formerly believed. It is thus impossible in the present state of our knowledge to identify females from other regions reliably. The present specimens however run to *G. nigrifacies* in Hesse's (1938) key and approximate to his description. From *G. nigrifacies* they differ in that the fore tibiae are paler, the brassy scaling extends over the scutum and the hyaline wings have paler yellowish to yellowish brown veins.

SOKOTRA : Hammadero, 1100 ft, 2 ♀, 8.iv.1967 (*K. M. Guichard*), BM(NH) and author's collection.

These specimens may be conspecific with the pair identified by Becker (1910) as *G. gibbosus* Meigen, which it has not been possible to trace.

*Phthiria* sp.

Ricardo (1903) reported two male *Phthiria* sp. from Sokotra. No specimens of this genus are present in Guichard's material and unfortunately the specimens collected by Grant can no longer be found in the British Museum.

*Chiasmella sica* sp. n.

The genus *Chiasmella* was erected by Bezzi (1924) for the single species *brevipennis* Bezzi from Southern Yemen. Doubt has been expressed whether the genus was distinct from *Chionamoeba* Sack, but Greathead (1967a) showed that it is a distinct genus of uncertain affinities, possibly closest to the Tomomyzinae in which he provisionally included it. The present species agrees in most characters with *C. brevipennis*, differing most notably in that the wing has an infuscated fore border, and that the tomentum and hair on the frons is gold in the male. It is a darker, more powerfully built species resembling a Therevid in appearance.

♂. *Head* : black, but frons red-brown and buccal rim yellowish. Occiput above and vertex covered in brown tomentum and blackish brown hair, frons with dense glittering gold tomentum and fine gold hairs, face with greyish tomentum and white hair and lower part of occiput with white hair, which is flattened and adpressed at the margins of the eyes. Antennae with first segment brown, second and third blackish, hairs pale yellowish. Styloform part of third longer than in *C. brevifacies*, equal in length to that of the rest of the antenna. Proboscis and palpi black, labella brown, hairs colourless. *Thorax* : black ; dorsal surface with dark brown tomentum, pale yellowish hairs on the anterior half, blackish ones on the posterior half, and with thin reddish gold hairlike scales. Notopleural stripe consists of an ill-defined band of white scaly hairs continuing around the margin of the scutellum as small white scales. Pleurae with white tomentum and white scaly hair. Macrochaetae strong, reddish gold. *Legs* : coxae and basal three-quarters of femora black, remainder yellow-brown but tarsi darker. Basal part of legs, to apices of femora, with dense white hair and scales, apices of femora and tibiae with yellow scales, tarsi with brown scales. Spines and spicules black, fore femora unarmed, mid with spines only in apical third, hind in apical two-thirds. *Wings* : hyaline with a brown infuscation in the costal, sub-basal, first basal, basal half of marginal and basal part of first submarginal cells to just beyond the middle crossvein. Venation as *C. brevifacies*, except that the second vein originates at a distance of about twice the length of the middle crossvein from that vein. Halteres yellow brown, with apices of knobs paler. *Abdomen* : black, hair at sides of first tergites and curved margins of succeeding tergites white. Median part of first and dorsal part of succeeding tergites with dark reddish gold scales and a posterior fringe of white scales. Lateral and ventral surfaces with white scales, hind margins of segments with tiny black hairs, longer and more conspicuous dorsally and towards the apex. Sternites almost entirely concealed by the recurved tergites. Hypopygium not examined.

Length of body 10 mm, of wing 8 mm.

♀. As male except that the head is entirely black and the gold on the frons is replaced by sparse whitish tomentum and pale yellowish white hair. Ovipositor concealed by a mass of pale gold hair.

Holotype ♂. SOKOTRA : Jebel Ommari, Hadibo Plain, 600 ft, 22.iii.1967 (*K. M. Guichard*), BM(NH).

Paratypes. SOKOTRA : Hadibo Plain, 2 ♀, iii.1967 (*K. M. Guichard*), BM(NH) and author's collection.

### *Petrorossia sokotrae* (Ricardo) comb. n.

(Text-figs. 1-2)

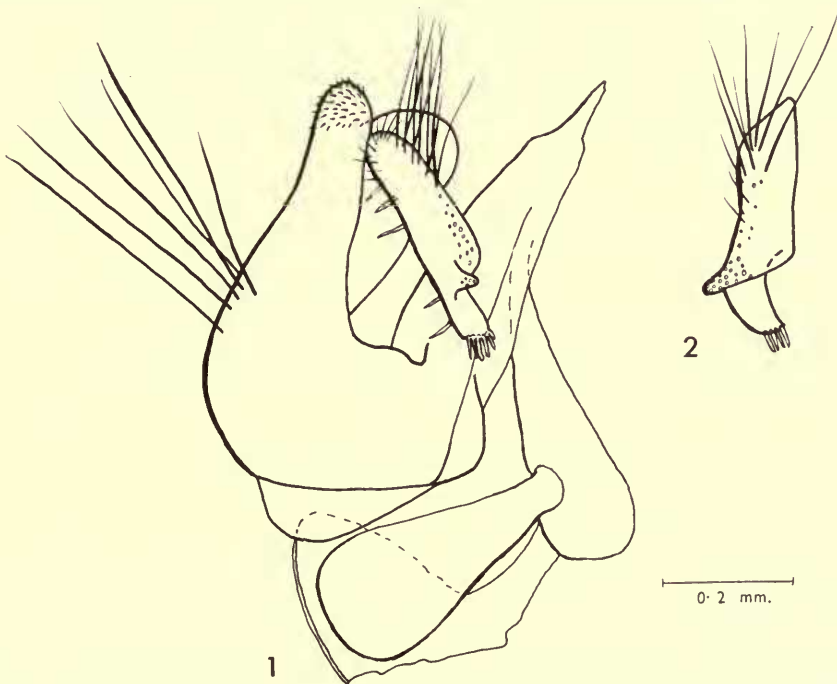
*Anthrax sokotrae* Ricardo, 1903 : 367.

*Thyridanthrax sokotrae* (Ricardo) Bezzi, 1924 : 22.

This species, which clearly belongs to the genus *Petrorossia*, was unaccountably listed by Bezzi (1929) under *Thyridanthrax*. It is one of the largest species of the genus but very variable in size ; the present specimens range between 5 and 12 mm. It belongs to the *P. fulvipes* Loew section of the genus but lacks a distinct wing pattern, the wings being tinged brownish, darker at the base and along the fore border and identical in both sexes.

*Head* : black, with grey tomentum except on the vertex and upper part of the frons, which are velvety black. Ocellar tubercle prominent, vertex almost three times its width in the male and only slightly wider in the female, and with a deep sulcus behind the ocellar tubercle separating the inflated halves of the occiput. Hairs on vertex, frons except for a few at the base of the antennae, and on the upper part of the sides of the occiput to the level of the antennae, black,

hairs at the base of the antennae and on the face reddish golden, remaining parts of occiput with gold hairs and with short pale yellowish hairs below. Antennae black with a reddish tinge and grey tomentum, hairs black, first segment large, almost as long as second and basal part of third combined, third with a short conical basal part sharply marked off from an elongate stylar part 3 times its length, style jointed at two-thirds of the distance from its base and with a short pale spicule at the apex. Proboscis brown, with golden hairs, broad, only slightly longer than the buccal cavity. Palpi short, black, with long golden hairs. *Thorax*: black with heavy grey tomentum on the pleura. Hairs of collar, humeral callus and mesepimeron rich golden, hair on metapleuron pale gold, scalelike, macrochaetae and fine scattered hairs on dorsal surface black. Dorsal surface also with short adpressed golden scalelike hairs. *Legs*: coxae blackish brown with grey tomentum and golden hair. Remainder red-brown, with the tips of the tarsi darkened. Hairs and scales golden except for an admixture of black scales on the hind femora in the middle above, and towards the apices of the hind tibiae in the female; in the male this blackening is more extensive with black scales and even black cuticle at the base of the femora. Spines and spicules black. Middle and hind femora with antero- and postero-ventral rows of small black spines. Claws black with brownish bases. Pulvilli well developed, whitish. *Wings*: greatly narrowed at base, alula absent, anal lobe extremely narrowed at base. Membrane brownish glistening darker at the base and along the fore-border. Veins brown. Upper branch of third vein sometimes with a short appendix. Venation normal. Squamae small, brownish tinged, with whitish fringes. Halteres with brown stalks and paler brown to ivory knobs, flattened. Abdomen elongate, flattened, reddish with black on tergites above except for their hind margins and the apical, sixth, tergite which is entirely red. First tergite covered with dense golden hair, and with dense flattened hair of the same colour below the scutellum and along the hind margin. Remaining tergites with sparse fine black hair and elongate gold scaly hairs. Sternites with gold hair and scales. Hypopygium (Text-figs.



FIGS. 1-2. *Petrorossia sokotrae*. 1, Lateral view of hypopygium; 2, apical view of telomere.

1 & 2) red. Telomere large and with unusual thick bristles on the dorsal surface and at the apex. Aedeagus and accessory structures less elaborate than in other species so far illustrated. Dense gold hair in the apical cavity concealing the ovipositor.

Length of body 7-13 mm, of wing 6-12 mm.

SOKOTRA : Adho Dimellus, 2800 ft, 5 ♂, 1 ♀, 24.iv.1967 (*K. M. Guichard*), 1 ♀ with same data except caught on 25.iv.1967, BM(NH) and author's collection.

Ricardo's type-series (loc. cit.) were captured at Homhil, Hadibo Plain, Addah Valley, as well as Adho Dimellus during January and February.

### *Anthrax fuscipennis* (Ricardo)

*Argyramoeba fuscipennis* Ricardo, 1903 : 366.

*Anthrax fuscipennis* (Ricardo) Becker, 1910 : 132.

Becker (1910) placed his *A. dentata* as a synonym of *A. fuscipennis* ; as thus accepted the species is widespread in the Mediterranean region, Arabia and north eastern Africa. Although many species of *Anthrax* are widespread and subject to variation in details of the colour pattern, this interpretation of the species should be treated with caution until the hypopygia of males from a number of localities can be checked with those of males from Sokotra. Unfortunately this is not yet possible as no male specimens have been captured on the island. The form of the hypopygium of material from northern Ethiopia has been illustrated (Greathead, 1967a).

SOKOTRA : Hadibo Plain, foothills 500 ft, 1 ♀, 30.iv.1967 (*K. M. Guichard*), Hadibo Plain, 1 ♀, iv. 1967 (*K. M. Guichard*), author's collection.

Ricardo's type-series were captured at Adho Dimellus and on the Hadibo Plain during January and February and Becker reported the species from Ras Shoab during the same months.

### *Anthrax aygulus* Fabricius

*Anthrax aygulus* Fabricius, 1805 : 121.

This species is now known to be widespread in the northern part of the Ethiopian Region. It has not previously been reported from Sokotra.

SOKOTRA : Hadibo Plain, 1 ♂, iv.1967 (*K. M. Guichard*), BM(NH).

### *Spogostylum* sp.? *ventrale* Bezzi

*Spogostylum ventrale* Bezzi, 1924 : 174.

Three female specimens of a species of *Spogostylum*, in rather poor condition, appear to belong to *S. ventrale* Bezzi ; however as the species of this genus are notoriously difficult to identify on external characters and many are apparently restricted to small areas and replaced by closely similar species in adjoining areas, the identification is regarded as provisional.

ABD-EL-KURI : Jebel Saleh, 1000-1500 ft, 3 ♀, 7.v.1967 (*K. M. Guichard*), BM(NH) and author's collection.

*Hemipenthes inauratus* (Klug)

*Anthrax inauratus* Klug, 1832 : No. 1.

*Thyridanthrax inauratus* (Klug) Bezzi, 1924 : 204.

*Thyridanthrax inauratus* (Klug) ; Engel, 1932-7 : 534.

*Hemipenthes inauratus* (Klug) Bowden, 1964 : 98.

*H. inauratus* is now known from localities in Ghana (Bowden, 1964) east to Somalia (Bezzi, 1924) and from Arabia (Klug, 1832) but has not previously been reported from Sokotra. It is one of the most beautiful Bombyliidae and is at once recognized by the purplish black head and thorax, dimidiate black wing pattern and golden scaling of the dorsal surface of the abdomen. The Sokotra specimens fall within the variation indicated in the quoted descriptions and are thus not morphologically distinct from continental specimens.

SOKOTRA : Suk, sea-level, 1 ♂, 1 ♀, 2.v.1967 (*K. M. Guichard*), BM(NH).

*Villa dioscoridae* sp. n.

(Text-figs. 3-5)

*Anthrax hottentotta* Linnaeus, 1758 : 590 ; Ricardo, 1903 : 368 [Mis-identification].

*Hemipenthes circumdatus* Meigen, 1820 : 143 ; Becker, 1910 : 133 [Mis-identification].

Recent work, taking a more critical view of *Villa* spp. and making use of the characters of the hypopygium, has suggested that there are more species in the *hottentotta* - *circumdatus* group than was formerly recognized (Lyneborg, 1965). Ricardo (1903) even regarded *circumdatus* as a synonym of *hottentotta*. For the present purpose it is sufficient to state that the Sokotran species is distinct and not a form of one of the Palaearctic members of the complex. Neither is it conspecific with the allied African species *galla* Greathead (1967a) to which it is closest.

From all the other species of the complex it differs in the brighter, more golden and less yellow pubescence, and the more clear cut, contrasting black and yellow banding of the abdomen, in having black hair on the face, black scales only on the legs, and black bands of scales across the sternites.

Holotype ♂. *Head* : black, as *V. hottentotta* (*sensu* Engel, 1932-7) or *V. galla*, except that all the hairs and scales on the frons and face are black, only those on the occiput being yellow and that the third antennal segment is tinged reddish. *Thorax* : similar to the other species but the hairs shorter than that of *V. hottentotta* and more richly coloured than either species ; that of the collar, dorsal surface and prealar callus deep golden yellow with a reddish tinge, that on remaining parts of the pleura straw-coloured. *Legs* : dark reddish, clothed in black scales and hairs except coxae ; fore and mid coxae with yellow hairs on basal half and black hairs and bristles on apical half, hind coxae mainly with yellow pubescence and only a few blackish bristles at the apex. *Wings* : veins darker, blackish, basal comb covered in black scales except for a patch of silvery ones at the base in addition to the silvery ones of the 'epaulette'. Venation normal. Squama opaque white with a pale yellow fringe. Halteres pale yellow-brown with a cream knob. *Abdomen* : hair short as *V. galla* but scales more distinctly yellow and denser, so that the pattern of light and dark bands is sharper. First tergite with shiny black scales, second with pale straw-yellow scales on basal third, remainder black, third with a narrow band of pale scales at the base, remainder black, fourth basal two-thirds pale, apical third black, fifth and sixth black with fringes of pale scales and tufts of long black

ones at the sides, seventh with pale scales fringed with long black ones. Sternites : only fourth entirely covered in pale scales, first to third with black ones in middle and fifth to seventh black with pale fringes. Hypopygium, (Text-figs. 3, 4 & 5), with black hair, very similar to the other closely allied species but the accessory structures broader and with deeper wing-like flanges.

Length of body 18 mm, of wing 16 mm.

Paratype ♀♀. *Head* : as male but vertex slightly wider and scales on face beneath the black hair yellow. *Thorax* : hair longer and denser. *Legs* : tending to less extensively black vestiture on coxae and in some with a few yellow hairs and scales at the bases of the femora. *Wings* : as male but pale scales at base of comb white and 'epaulette' blackish. *Abdomen* : hairs longer and denser, pattern as male but with a tendency for the pale bands to be broader and wider at the sides than in the middle. Ovipositor reddish with yellow hair and about eight reddish spines on each side.

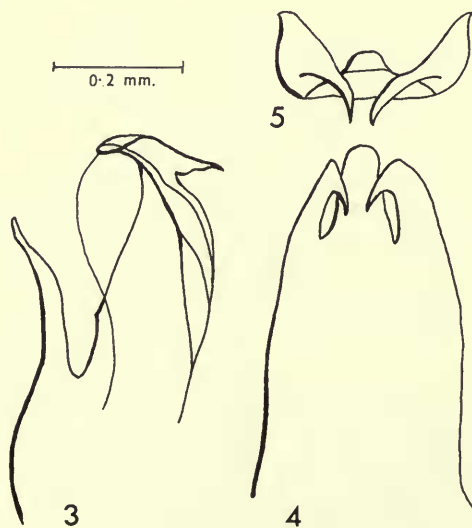
Length of body 16-19 mm, of wing 9-17 mm.

Holotype ♂. SOKOTRA : Adho Dimellus, 2800 ft, 25.iv.1967 (*K. M. Guichard*), BM(NH).

Paratypes. SOKOTRA : Alilo Valley, 3000 ft, 1 ♂, 1.xi.1899 [*sic*] ; Alilo Valley, 1 ♀, 1.ii.1899 ; Homhil, 1500 ft, 4 ♀, 20, 22, 25.i.1899 ; Adho Dimellus, 3500 ft, 1 ♀, 7.ii.1899 ; Goahal Valley, 1 ♀, 16.i.1899 (all collected *W. R. O. Grant*), all in BM(NH) ; Hamadero, 1100 ft, 1 ♀, 8.iv.1967 (*K. M. Guichard*), in author's collection.

Two females from Abd-el-Kuri representing an isolated population have yellow scales on the frons as well as the face, yellow hair on the face except on the midline, hair shorter and paler more straw-coloured and (dorsal surfaces denuded) abdominal pattern less sharp with scattered yellow scales among the black ones. From above these females bear a close resemblance to *V. galla*.

ABD-EL-KURI : 2 ♀, 8.v.1967 (*K. M. Guichard*), BM(NH) and author's collection.



FIGS. 3-5. *Villa dioscoridae*. 3, Lateral view of aedeagus ; 4, apical view of accessory structures ; 5, dorsal view of same.



*Thyridanthrax argentifrons* (Becker) **comb. n.**

*Hemipenthes argentifrons* Becker, 1910 : 133.

Becker (loc. cit.) described the species from two males. The present material consists of three rather denuded females, which agree more or less with Becker's description except that there are few silver scales on the posterior abdominal tergites. As such characters are liable to sexual dimorphism (e.g. *T. cunamae* Greathead, 1967a) there is little doubt that the present specimens represent the female of *T. argentifrons*. It is one of the group of *Paragus*-like species, as noted by Becker, but is at once distinguished from other known species by the heavy silver scaling on the frons combined with the absence of yellow hair or scaling from the abdomen with its contrasting black and white pattern. The following description is based on the females and includes differences from the males as described by Becker.

*Head* : black, facial cone bluntly rounded at its apex, face convex, frons two and a half times the width of the ocellar tubercle at the vertex (in male twice the width). Hair on frons and face short, sparse, glistening black. Scales on lower half of frons large, dense, silver, projecting over bases of antennae, on upper part of frons and occiput small, silvery, opalescent, on face similarly opalescent but appearing glistening black when viewed from some angles. Antennae black, first and second segments cylindrical with short black hair except on the underside of first where it is longer, third one and a half times length of first and second, broad at base and closely applied to the second, tapering rapidly to a thick styliform part about two-thirds the length of the segment and terminating in a minute spicule. Proboscis black at base, brown towards apex, tips of labella projecting beyond buccal cavity. Palpi dark brown with brown hairs. *Thorax* : black with a brown tomentum. Hair of collar and notopleural tuft pale brownish yellow, not red-brown as described by Becker for the male. Dorsal surface denuded but according to Becker the males have red-brown hair and metallic golden scales. Notopleural stripes well developed, white, metapleural tuft and plumula also white. Remaining areas of pleura bare or possibly denuded. Prosternum with a row of stiff black hairs. Macrochaetae long, robust, black. *Legs* : black. Coxae with stiff black hair, femora with sparse fine brown hair below, spines and claws black and scales glistening black. Fore and mid femora unarmed, hind with three to four spines on the underside at the middle and one subapical one. *Wings* : hyaline. Veins brown, basal hook and vestigial basal comb black. Venation ; middle crossvein at basal third of discoidal cell, which is small and narrow, so that the posterior cells are long, contact of third and fourth posterior cells with discoidal cell about equal. Squama brownish at base, yellowish at margin, with a fringe of translucent white scales. *Abdomen* : black with glossy black scales and stiff black hair at the sides and across the hind margins of the tergites, except for the first which has white hair and two bands of white scales, a narrow one along the hind edge of the first tergite [on second according to Becker] and a broader one across the anterior third of the third tergite ; however the fourth to seventh tergites are badly denuded and there are traces of silver scales intermixed with the black ones. Sternites black, first four with opalescent whitish scales and brownish hair, remainder with glossy black scales and black hair. Ovipositor exposed, with five reddish spines on each side.

Length of body 5-7 mm, of wing 5-7 mm.

SOKOTRA : Jebel Omari, Hadibo Plain, 600 ft, 2 ♀, 22.iii.1967 (*K. M. Guichard*) ; Kalinsiya, sea-level, 1 ♀, 26.iii.1967 (*K. M. Guichard*), BM(NH) and author's collection.

The syntypes, two males, were collected at Ras Shoab in January.

*Thyridanthrax* sp. ? *argentifrons* (Becker)

Three of the four female specimens from Abd-el-Kuri identified by Ricardo (1903) as *Anthrax* sp. have been examined. They are all badly denuded, rather faded and greasy, which makes certain identification impossible, but the general close resemblance to the preceding species suggests that they probably belong to it or to a divergent subspecies developed in response to isolation on Abd-el-Kuri.

They differ from *T. argentifrons* females in that they are larger, 9–10 mm, the cuticle is not completely black but tends to have reddish areas, antennae dark reddish, the upper part of the pleura are densely covered in yellowish brown hair, the legs are dark reddish, the hair at the base of the abdomen is pale yellowish, the terminal abdominal segments show signs of extensive silver scaling and that the sternites are all covered in pale hair and silvery scales.

ABD-EL-KURI, 2 ♀, 22.ii.1899 ; 1 ♀, 5.xii.1898 (*W. R. O. Grant*), BM(NH).

*Thyridanthrax alatus* (Becker) **comb. n.**

*Hemipenthes alatus* Becker, 1910 : 134.

The species was described from a single female and is represented by a female in the present collection. It is a pale-haired species with brown areas on the body and a shiny black vertex with indistinct ocellar tubercle, a combination of characters allying it with *T. capella* Greathead and *T. pallescens* Greathead, a species-group which seems, as far as it has been recognized, to be characteristic of the desert areas bordering the Palaearctic and Ethiopian regions (Greathead, in press).

*Head* : frons to region of antennae, and a triangular area between the antennae, genae and occiput black, lower parts red-brown, face conical, eye indentation barely indicated, bisecting line very short, vertex broad, three times the distance between the posterior ocelli in width, ocellar tubercle indistinct. Vertex glossy black, bare except for sparse black hairs, frons with sparse black hair on the black area and fine opalescent scales, face and pale parts with short yellowish hair and opalescent scales except for a tuft of short black hairs at the apex of the facial cone, occiput with short pale yellowish hair and also with opalescent scales. Antennae ; first segment red, remainder black, hairs on first and second segments black above, brownish yellow below, third broad, strap-like, tapering sharply to a minute style at the apex, twisted so that it is vertically flattened at the base and horizontally flattened at the apex. Proboscis projecting, labral part red, labial part black, palpi brown elongate with yellowish hairs. *Thorax* : black but with extensive brownish areas on the pleura, and scutellum red except for the extreme base. Hairs of collar and pleura pale white, tinged yellowish, dorsal surface denuded but showing traces of short golden brown hair and fine scales. Scales among the hairs at the sides of the dorsal surface white, tinged buff. Macrochaetae yellow-brown. Metapleura and hypopleura bare. *Legs* : black, except for upper surfaces of femora and coxae, which are brown. Hair and scales on coxae white, spines, spicules and scales on remaining parts black. Claws black with red bases. *Wings* : base, entire costal, basal and anal cells and marginal and discoidal cells to level of middle crossvein tinged pale yellow, remainder smoky hyaline. Veins yellow-brown. Upper branch of third vein straight at base and bent at right angles at the first bend. Discoidal cell truncate, the vein between it and the second basal cell long almost as long as the cell is wide at the wing margin, contact of discoidal and fourth posterior cells equal to that of the latter with the second basal cell. Basal hook brown, comb black with whitish scales. Squama and alula translucent yellowish with white fringes. *Abdomen* : black along the midline and bases of tergites, and sternites merging to red-brown on the remainder

giving the appearance of red-brown with an ill defined black median stripe. Hair on first segment and sides of basal half of second segment white, fine scattered hair on dorsal surface of segments 2-4 and hair rows at the margins of tergites on the dorsal surface black, those at the sides and on the apical segments yellowish ; scales at the bases of the tergites white gradually becoming yellow at the apex, however the pattern is difficult to distinguish as the specimen is rather denuded. Sternites with white scales and fine sparse yellowish hairs. Ovipositor red-brown with three weak spines at each side.

Length of body 11 mm, of wing 9 mm.

ABD-EL-KURI : Jebel Saleh, 1000-1500 ft, 1 ♀, 7.v.1967 (*K. M. Guichard*), BM(NH).

Becker's type is from Sokotra, February 1899.

### *Exoprosopa punctipennis* Ricardo

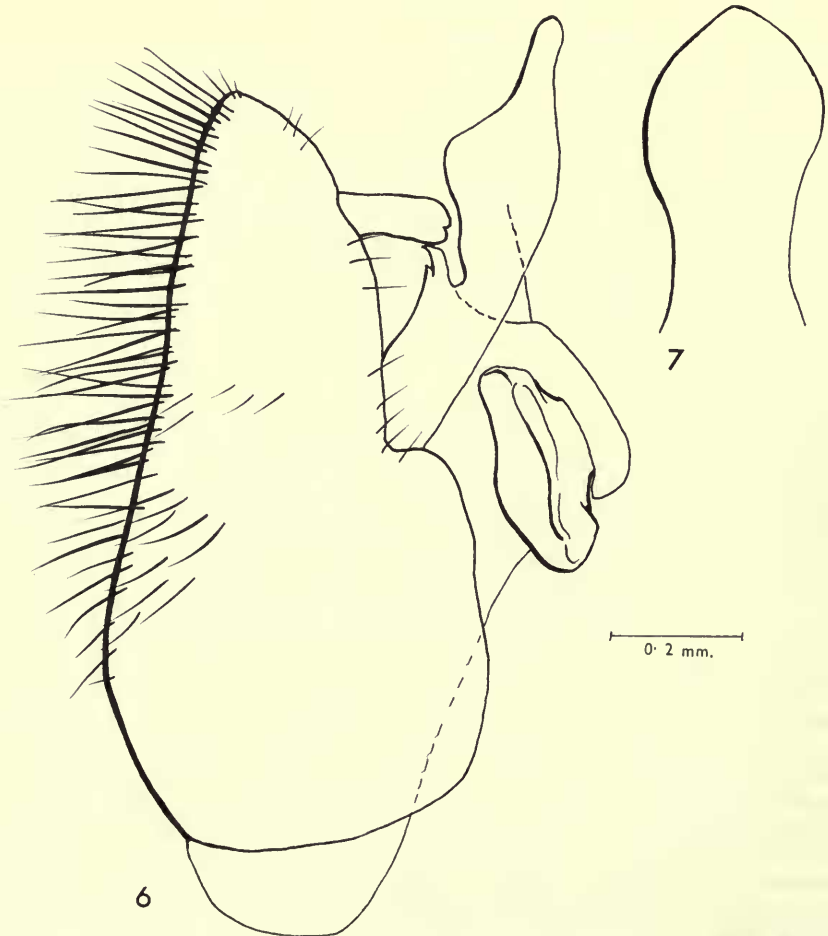
(Text-figs. 6, 7)

*Exoprosopa punctipennis* Ricardo, 1903 : 364.

This seems to be one of the commonest and most striking Bombyliidae from Sokotra. It is very similar in appearance to *E. punctulata*, a common and widespread species on the African mainland. It differs in being larger (10-15 mm), more brightly coloured and heavily marked, in having dark-haired pleura, in that the abdomen is only obscurely reddish at the sides, and in that a short appendix juts into the discoidal cell from the recurrent angle of the vein separating it from the third posterior cell. None of these differences is an important character, and as it has spicules on the fore tibiae, like *E. punctulata* but unlike most other species of the genus, it is concluded that its resemblance to this species is one of close relationship and that *E. punctipennis* is probably derived from it. Ricardo (1903) draws attention to the appendix jutting into the discoidal cell from the vein dividing it from the third posterior cell. This character, like many minor instabilities of wing venation, does not invalidate the proposed relationship with *E. punctulata*, as an examination of a series of this species shows that this vein is variable in length and angularity and in the development of an appendix in one or both wings. Similarly *E. disrupta* (Walker) which also belongs to the *E. punctulata* group (Greathead, 1967a ; *E. disrupta* also has spiculate front tibiae, a point not previously mentioned) shows a tendency to the development of an appendix into the discoidal cell.

*Head* : brownish black with a reddish buccal rim and a heavy red-brown tomentum. Face conical, its sides and base forming an equilateral triangle in profile. Eyes separated by three and a half to four times the width of the ocellar tubercle in both sexes. Eye indentation barely indicated, bisecting line very short. Hairs sparse, black on vertex, frons, face and under-side of head, on frons and face with scattered opalescent scales beneath, occiput with very short brown hairs and dense silvery scales at the posterior margins of the eyes. Antennae with first segment red-brown, two and a half times the length of the second, which is dull brown, shorter than wide, third dull brown, as long as first and second segments together, with a rounded base and tapering to an elongate red-brown style three-quarters the length of the third segment, style with a distinct spicule at its apex. Proboscis black shagreened, as long as the greatest length of the head, thus it is conspicuously projecting. Palpi black with fine black hairs. *Thorax* : black except apical two-thirds of scutellum, which is red heavily dusted with brown tomentum. Hair of collar above between notopleural stripes pale yellow, the hairs darker

yellow at their tips, sparse hair on dorsal surface, hair on pleura except upper parts of metapleural tuft, black, also with dense stripes of white scaly hairs along notopleura, upper part of metapleural tuft and plumula white. Scales on dorsal surface very sparse opalescent, macrochaetae black. *Legs*: black including all hairs scales and spines. Fore tibiae spiculate, only hind femora with spines below, these with a complete row. *Wings*: base, costal cell, first basal cell, submarginal cell except broad apical part, basal half of submarginal and second basal cells, extreme base of first posterior cell, basal third of anal and base of axillary cell all infuscated chocolate-brown; also with chocolate-brown spots at the bases of the second and third submarginal, discoidal, second, third and fourth posterior cells. Basal hook and comb black, squama white, its fringe and fringe of alula also white. Venation with veins separating submarginal cells angularly bent, not smoothly curved, vein between discoidal and third basal cell long and contorted, bent twice almost at right angles into the third basal cell (thus giving a broad apex to the discoidal cell) and into the discoidal cell where a short appendix is emitted into that cell. *Abdomen*, ♂: conical, tergites black, obscurely reddish at the sides, first tergite with white hair except for a line of black hairs along its margin on the dorsal surface, second tergite with white hair at the sides of the basal two-thirds and with a narrow band of white



FIGS. 6-7. *Exoprosopa punctipennis*. 6, Lateral view of hypopygium; 7, dorsal view of aedeagus showing outline of accessory structure.

scales at the base, otherwise with black hair and glossy black scales, third, fifth and sixth tergites also with white basal bands, otherwise tergites with black hair and scales. Sternites dark red with black hair and scales. Hypopygium (Text-figs. 6 & 7) red with black hairs. Very similar to that of *E. punctulata* (Hesse, 1956 : fig. 254) differing only in minor details of shape. ♀ : as male but flattened, not conical, and ovipositor red with five black spines on each side.

Length of body 10-15 mm, of wing 8-14 mm.

SOKOTRA : Hammadero, 1100 ft, 2 ♂, 1 ♀, 8.iv.1967 ; Kalinsiya, sea-level, 2 ♂, 1 ♀, 26.iii.1967 ; Hadibo Plain, foothills, 500 ft, 1 ♂, 30.iv.1967 ; Jebel Omari, Hadibo Plain, 600 ft, 1 ♂, 22.iii.1967 (all collected K. M. Guichard), BM(NH) and author's collection.

Ricardo's (1903) type-series were collected at Homhil, Adho Dimellus and Hadibo Plain, December - February. Becker (1910) recorded it from Sokotra, January and February.

### *Exoprosopa insularis* Ricardo

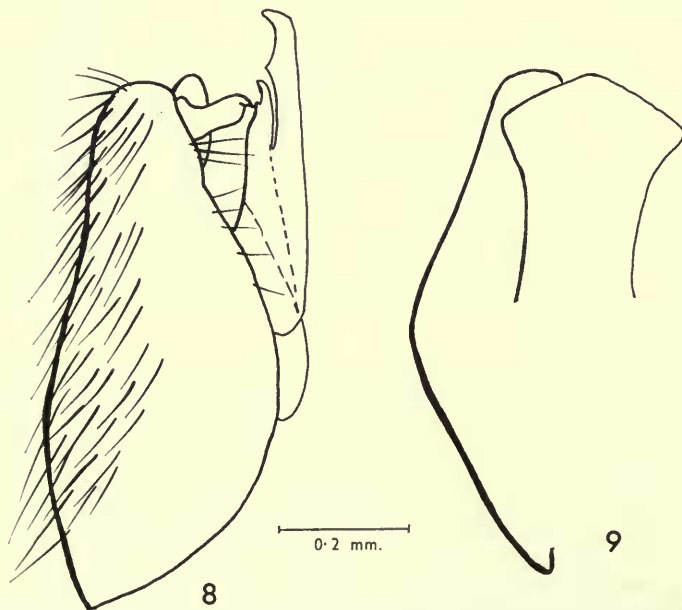
(Text-figs. 8, 9)

*Exoprosopa insularis* Ricardo, 1903 : 365.

Ricardo (1903) compared this species with *E. disrupta* but as shown above *E. disrupta* is related to *E. punctulata* and *E. punctipennis* while *E. insularis* lacks the special characters of this group ; in contrast the front tibiae are not spiculate, the proboscis is short and the abdomen black, broad and flattened. Ricardo's other comparison with *E. venus* Wied. [*sic*], in fact *E. venosa* Wied. *sensu* Loew (described by Hesse, 1956, as *E. leucothyrida*), is more apposite. *E. insularis* has the highly contorted venation between the submarginal cells, narrowed first posterior cell, unstable venation tending to emit appendices either into the discoidal or third posterior cells and concentration of the infuscation along the margin of the veins, dark colouring and other body characters of species of the subgenus *Acrodisca* Bezzi. It seems to belong more properly with this grouping than with the *E. punctulata* group. As suggested by Bowden (1964) and accepted by Greathead (1967a), there is room for a regrouping of species within the genus, relying more on general similarities than single venational characters which are not always reliable. On this basis both *E. insularis* and *E. leucothyrida* belong in a grouping centred on Bezzi's subgenus *Acrodisca*.

*Head* : black with brown tomentum, brown around ocellar tubercle and in two stripes running from it to the antennae, genae and buccal rim yellow-brown. Sparse short hairs on occiput above, vertex, frons and face black. Hair at sides of occiput and fringing the posterior margin pale yellow. Scales on vertex and frons glossy black, on face mixed glossy black and dull gold, and on occiput dull gold. Eyes separated at vertex by three times the width of the ocellar tubercle, which is set forward of the narrowest point at the top of the head. Eye indentation straight-sided, shallow, so that the emargination is symmetrical and angular, bisecting line short. Facial cone triangular in profile, the apical angle being almost a right angle. Antennae ; first segment red with black hair, second black about half length of first with black hair, third slightly longer than first two segments together, upper surface straight, lower sloping upwards so that it is conical, with the apex over the circumference of the base, lower surface grooved, black above narrowly red below, style about two-thirds length of the third segment, black and

with a reddish spicule at the apex. Proboscis with only the tips of the labella projecting, reddish black with a shiny black heavily shagreened labial sclerite below. Palpi black with black hairs. *Thorax* : black with brown tomentum and a paler median stripe of tomentum along the length of the scutum. Dorsal surface with sparse black hair and shiny black scales. Notopleural stripe and margin of scutellum marked by dull golden elongate scales. Hair on collar and pleura dull brownish gold with an admixture of black hair on the prosternum and lower part of propleura, and also a few fine black hairs on the mesepisternum. Metapleura bare except for the metapleural tuft. Plumula and prealar tuft pale yellowish. Macrochaetae long, fine, black. *Legs* : dark reddish heavily overlaid with shiny black scales, spines and spicules black except that the fine hairs on the fore tibiae and tarsi and the apical segments of the other tarsi are paler yellowish, hair black except for an admixture of dull gold ones on the hind coxae. Claws red at their bases, black apically. Fore femora unarmed, mid with four anterolateral and two posterolateral spines and hind with a complete row of about eight posterolateral spines. *Wings* : opaque greyish, all veins broadly bordered with dark brown, so that only the centres of the wider cells are clear, praediscoidal spot and a fine border running from it to the base of the third basal cell along the vein, and another running along the first vein and ending in a spot at the root of the second, grey. Venation as in *Defilippia* with the apical vein of the discoidal cell sinuous and parallel with the margin but with an angular bend into the third posterior cell, emitting an appendix on some specimens and others with an appendix into the discoidal cell at the bend towards the base. Basal hook and comb black. Squama yellowish grey with a yellow fringe. *Abdomen* : black with obscure reddish areas at the margins of the tergites and on the sternites. First tergite and sides of second and third with dull golden hair and scales (on the reflexed margin below they are black), remaining sparse hair and fringe of scales at the margins of the sclerites black. Scales on second tergite black, with white scales at the anterior corners bordered with yellow scales which extend in a band across the base at the middle ; third segment with the scales on the basal half yellow, darker, more golden where they join the black scales on the posterior half ; remaining segments with intermixed black and golden scales, the latter denser towards the posterior margins, tending to give



FIGS. 8-9. *Exoprosopa insularis*. 8, Lateral view of hypopygium ; 9, dorsal view, outline of paramere and aedeagal accessory structure.

an irregular banded appearance. Sternites with sparse yellow hair and golden scales. Hypopygium (Text-figs. 8 & 9), dark red with golden hair. Ovipositor with five strong red spines at each side and sparse black hair.

Length very variable, the two males 8 mm and 10.5 mm, wings 8 mm and 11 mm. The females 8 mm and 14 mm and their wings 8 and 14 mm also.

SOKOTRA : Adho Dimellus, 1 ♂, 24.iv.1967 (*K. M. Guichard*) ; Hammadero, 1 ♂, 2 ♀, 18.iv.1967 (*K. M. Guichard*), BM(NH) and author's collection.

Ricardo's type was caught at Jenaagahan in January and Becker (1910) reported it from Sokotra in January and February.

### Family NEMESTRINIDAE

#### *Atriadops cinnamonea* Brunetti

*Atriadops cinnamonea* Brunetti, 1929 : 5.

This species was described from Malawi (Nyasaland) and the only other record is a single male from Tanzania, Ilonga, at light, 20.ii.1965 (*I. A. D. Robertson*), the hypopygium of which has been illustrated by Greathead (1967b).

SOKOTRA : Hammadero, 1100 ft, 2 ♂, 18.iv.1967 (*K. M. Guichard*), BM(NH) and author's collection.

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